Amendments to the Claims

Please amend the claims as follows:

19.   (Currently Amended) A wireless digital audio system comprising:

at least one audio source to produce an audio output ~~representative of music~~;

at least one digital <u>portable</u> audio transmitter operatively coupled to said at least one audio source, said at least one <u>portable</u> audio transmitter comprising:

a first analog low pass filter receiving audio output from said at least one audio source;

a digital low pass filter;

an analog-to-digital converter (ADC) operatively coupled between said first analog and digital low pass filters;

a first encoder receiving output from said digital low pass filter and being configured to reduce intersymbol interference (ISI);

a second channel encoder operatively coupled to said first encoder and adapted to reduce transmission errors;

a digital modulator operatively coupled to said second channel encoder; and

a differential phase shift key (DPSK) module receiving output from said digital modulator and a unique user code bit sequence and being configured for direct sequence spread spectrum (DSSS) communication, said DPSK module transmitting a corresponding DSSS signal having said audio output ~~representative of the music~~ and the unique user code bit sequence;

at least one <u>portable</u> audio receiver configured for digital wireless communication with said at least one <u>portable</u> audio transmitter <u>and utilizing an embedded fuzzy logic detector wherein the fuzzy logic detector activates fuzzy logic rules and performs a defuzzification operation in response to a received user code to optimize digital signal processing</u>, said at least one <u>portable</u> audio receiver comprising:

a band pass filter (BPF) configured to process said transmitted DSSS signal;

a direct conversion module receiving output from said BPF and being

configured to capture the correct unique user code bit sequence embedded in said processed DSSS signal;

a digital demodulator adapted to process output from said direct conversion module;

a Viterbi decoder operatively coupled to said digital demodulator and generating a corresponding digital output;

a source decoder processing said digital output from said Viterbi decoder and being configured to decode the digital signal encoded by said first encoder;

a second analog low pass filter; and

a digital-to-analog converter (DAC) operatively coupled between said source decoder and said second analog low pass filter, said second analog low pass filter generating an audio output ~~representative of the music~~ corresponding to the decoded and converted digital signal; and

at least one module adapted to reproduce said <u>generated</u> audio output ~~representative of said music~~, if the unique user code bit sequence is recognized, said audio output having been wirelessly transmitted from said at least one audio source ~~to a user for private audio reproduction of said music~~ without interference from other users or wireless devices <u>when operated within a shared space containing multiple users of wireless devices utilizing code division multiple access (CDMA) communication</u>.

20.   (Previously Presented) The wireless digital audio system of Claim 19, wherein said BPF is a wideband BPF.

21.   (Previously Presented) The wireless digital audio system of Claim 19, wherein said modulator is a 64-Ary modulator.

22.   (Previously Presented) The wireless digital audio system of Claim 19, wherein said demodulator is a 64-Ary demodulator.

23.   (Previously Presented) The wireless digital audio system of Claim 19,

wherein said generated audio output is in the approximate range of 20 Hz to 20 kHz.

24.   (Previously Presented) The wireless digital audio system of Claim 19, wherein said spread spectrum signal is transmitted at about 2.4 GHz via an omni-directional antenna.

25.   (Previously Presented) The wireless digital audio system of Claim 24, wherein said spread spectrum signal is transmitted at a power of about 100 milliwatts or less.

26.   (Previously Presented) The wireless digital audio system of Claim 19, wherein said ADC is a 4-bit analog-to-digital converter.

27.   (Cancelled).

28.   (Cancelled).

29.   (Previously Presented) The wireless digital audio system of Claim 19, wherein said BPF is operatively coupled to at least one antenna configured to receive said transmitted DSSS signal.

30.   (Currently Amended) A wireless digital audio system, comprising:
at least one audio source;
at least one portable digital audio transmitter operatively coupled to said at least one audio source, said at least one portable digital audio transmitter comprising:
a first analog low pass filter receiving audio output from said at least one audio source;
a digital low pass filter;
an analog-to-digital converter (ADC) operatively coupled between said first analog and digital low pass filters;
a first encoder receiving output from said digital low pass filter and being

configured to reduce intersymbol interference (ISI);

a second channel encoder operatively coupled to said first encoder and adapted to reduce transmission errors;

a digital modulator operatively coupled to said second channel encoder; and

a differential phase shift key (DPSK) module receiving output from said digital modulator and a unique user code and being configured for direct sequence spread spectrum (DSSS) communication, said DPSK module transmitting a corresponding DSSS signal;

at least one audio receiver configured for digital wireless communication with said at least one portable digital audio transmitter and utilizing embedded fuzzy logic to enhance detection of the unique user code in said transmitted DSSS signal, said at least one audio receiver comprising:

a band pass filter (BPF) configured to process said transmitted DSSS signal;

a direct conversion module receiving output from said BPF and being configured to capture the correct bit sequence embedded in ~~said processed~~ the received DSSS signal;

a digital demodulator adapted to process output from said direct conversion module;

a Viterbi decoder operatively coupled to said digital demodulator and generating a corresponding digital output;

a source decoder processing said digital output from said Viterbi decoder and being configured to decode the digital signal encoded by said first encoder;

a second analog low pass filter; and

a digital-to-analog converter (DAC) operatively coupled between said source decoder and said second analog low pass filter, said second analog low pass filter generating the audio output;

at least one module adapted to reproduce said amplified audio output, if the unique user code is recognized, said audio output having been wirelessly transmitted from said at least one audio source to a user privately without interference from other users or wireless devices when operated in a shared space containing multiple users of wireless devices utilizing code division multiple access (CDMA) communication..

31.   (Previously Presented) The wireless digital audio system of Claim 30, wherein said at least one audio amplifying module includes at least one power amplifier, said at least one power amplifier being configured to provide a low distortion audio signal output.

32.   (Previously Presented) The wireless digital audio system of Claim 31, wherein said at least one audio reproducing module includes at least one headphone speaker, said at least one headphone speaker receiving said low distortion audio signal output from said at least one power amplifier.

33.   (Currently Amended) A wireless digital audio system, comprising:

at least one audio source;

at least one digital audio transmitter operatively coupled to said at least one audio source;

at least one audio receiver adapted for digital wireless communication with said at least one <u>digital</u> audio transmitter, each of said at least one digital audio transmitter and receiver being configured for code division multiple access (CDMA) communication; and

at least one module adapted to audibly reproduce ~~said~~ processed CDMA signal <u>and utilizing an embedded fuzzy logic detector wherein the fuzzy logic detector activates fuzzy logic rules and performs a defuzzification operation in response to a received unique user code to enhance detection of the unique user code,</u> said CDMA communication configuration providing a user with independent audio reproduction <u>operation</u> free of interference from other users or wireless devices <u>when operated in a shared space containing multiple users of wireless transmission devices</u>.

34.   (Currently Amended) A wireless digital audio system, comprising:

at least one audio source;

at least one digital audio transmitter operatively coupled to said at least one audio source;

at least one audio receiver adapted for digital wireless communication with said at

least one <u>digital</u> audio transmitter, each of said at least one digital audio transmitter and receiver being configured for code division multiple access (CDMA) communication;

at least one module adapted to amplify ~~said~~ processed CDMA signal; and

at least one module adapted to audibly reproduce said amplified signal, <u>and utilizing an embedded fuzzy logic detector wherein the fuzzy logic detector activates fuzzy logic rules and performs a defuzzification operation in response to a received unique user code to enhance detection of the unique user code</u>, said CDMA communication configuration providing a user with independent audio reproduction <u>operation</u> free of interference from other users or wireless devices <u>when operated in a shared space containing multiple users of wireless transmission devices</u>.

37.   (Previously Presented) The wireless digital audio system of Claim 33, wherein said at least one audio source provides analog output in the approximate range of 20 Hz to 20 kHz.

38.   (Previously Presented) The wireless digital audio system of Claim 34, wherein said at least one audio source provides analog output in the approximate range of 20 Hz to 20 kHz.

41-42. (Cancelled).

43.   (Currently Amended) A wireless digital audio system, comprising:

at least one audio source;

at least one digital audio transmitter operatively coupled to said at least one audio source, said at least one audio transmitter comprising:

a first analog low pass filter receiving audio output representative of music from said at least one audio source;

a digital low pass filter;

an analog-to-digital converter (ADC) operatively coupled between said first analog and digital low pass filters;

a first encoder receiving output from said digital low pass filter and being

configured to reduce intersymbol interference (ISI);

a second channel encoder operatively coupled to said first encoder and adapted to reduce transmission errors;

a digital modulator operatively coupled to said second channel encoder; and

a differential phase shift key (DPSK) module receiving output from said digital modulator and a unique user code bit sequence and being configured for direct sequence spread spectrum (DSSS) communication, said DPSK module transmitting a corresponding DSSS signal;

at least one audio receiver configured for digital wireless communication with said at least one audio transmitter, said at least one audio receiver comprising:

an embedded fuzzy logic detector wherein the fuzzy logic detector activates fuzzy logic rules and performs a defuzzification operation in response to a received unique user code to enhance detection of the unique user code;

a band pass filter (BPF) configured to process said transmitted DSSS signal;

a direct conversion module receiving output from said BPF and being configured to capture the correct unique user code bit sequence embedded in said processed the received DSSS signal;

a digital demodulator adapted to process output from said direct conversion module;

a Viterbi decoder operatively coupled to said digital demodulator and generating a corresponding digital output;

a source decoder processing said digital output from said Viterbi decoder and being configured to decode the digital signal encoded by said first encoder;

a second analog low pass filter; and

a digital-to-analog converter (DAC) operatively coupled between said source decoder and said second analog low pass filter, said second analog low pass filter generating an audio output representative of said music corresponding to the decoded and converted digital signal; and

at least one module adapted to reproduce said generated audio output, if the unique user code bit sequence is recognized, said audio output representative of said music having been wirelessly transmitted from said at least one audio source to a user

privately without interference from other users or wireless devices <u>when operated in a</u> <u>shared space containing multiple users of wireless transmission devices</u>.

44.   (Currently Amended) A wireless digital audio system, comprising:

at least one audio source;

at least one digital audio transmitter operatively coupled to said at least one audio source, said at least one audio transmitter comprising:

a first analog low pass filter receiving audio output ~~representative of music~~ from said at least one audio source;

a digital low pass filter;

an analog-to-digital converter (ADC) operatively coupled between said first analog and digital low pass filters;

a first encoder receiving output from said digital low pass filter and being configured to reduce intersymbol interference (ISI);

a second channel encoder operatively coupled to said first encoder and adapted to reduce transmission errors;

a digital modulator operatively coupled to said second channel encoder; and

a differential phase shift key (DPSK) module receiving output from said digital modulator and a unique user code and being configured for direct sequence spread spectrum (DSSS) communication, said DPSK module transmitting a corresponding DSSS signal;

at least one audio receiver configured for digital wireless communication with said at least one audio transmitter, said at least one audio receiver comprising:

<u>an embedded fuzzy logic detector wherein the fuzzy logic detector activates fuzzy</u> <u>logic rules and performs a defuzzification operation in response to a received unique user</u> <u>code to enhance detection of the unique user code;</u>

a band pass filter (BPF) configured to process said transmitted DSSS signal;

a direct conversion module receiving output from said BPF and being configured to capture the <u>correct</u> unique user code <u>bit sequence</u> embedded in ~~said processed~~ <u>the</u> <u>received</u> DSSS signal;

a digital demodulator adapted to process output from said direct conversion

module;

a Viterbi decoder operatively coupled to said digital demodulator and generating a corresponding digital output;

a source decoder processing said digital output from said Viterbi decoder and being configured to decode the digital signal encoded by said first encoder;

a second analog low pass filter; and

a digital-to-analog converter (DAC) operatively coupled between said source decoder and said second analog low pass filter, said second analog low pass filter generating an audio output ~~representative of the music~~ corresponding to the decoded and converted digital signal;

at least one module adapted to amplify said generated audio output; and

at least one module adapted to reproduce said amplified audio output, if the unique user code is recognized, said audio output having been wirelessly transmitted from said at least one audio source to a user ~~privately~~ without interference from other users or wireless devices when operated in a shared space containing multiple users of wireless transmission devices.

45.   (Previously Presented) The wireless digital audio system of Claim 43, wherein said at least one audio source provides analog output in the approximate range of 20 Hz to 20 kHz.

46.   (Previously Presented) The wireless digital audio system of Claim 44, wherein said at least one audio source provides analog output in the approximate range of 20 Hz to 20 kHz.

47.   (Canceled).

48.   (Canceled).

49.   (Previously Presented) The wireless digital audio system of Claim 43, wherein said at least one audio source is a portable music player.

50.   (Previously Presented) The wireless digital audio system of Claim 44, wherein said at least one audio source is a portable music player.

51.   (Previously Presented) A wireless digital audio transmitter, comprising:

a first analog low pass filter receiving audio output representative of music from at least one audio source;

a digital low pass filter;

an analog-to-digital converter (ADC) operatively coupled between said first analog and digital low pass filters;

a first encoder receiving output from said digital low pass filter and being configured to reduce intersymbol interference (ISI);

a second channel encoder operatively coupled to said first encoder and adapted to reduce transmission errors;

a digital modulator operatively coupled to said second channel encoder;

a code generator to add a unique user code to a modulator output, the modulator output including the audio output representative of said music; and a differential phase shift key (DPSK) module receiving the modulator output from said digital modulator and the unique user code and being configured for direct sequence spread spectrum (DSSS) communication, said DPSK module transmitting a corresponding DSSS signal.

52.   (Currently Amended) A wireless digital audio receiver, comprising:

a band pass filter (BPF) configured to process a transmitted DSSS signal;

a direct conversion module receiving output from said BPF and being configured to capture a unique user code bit sequence embedded in said processed DSSS signal;

a digital demodulator adapted to process output from said direct conversion module;

a Viterbi decoder operatively coupled to said digital demodulator and generating a corresponding digital output;

a source decoder receiving said digital output from said Viterbi decoder and being configured to decode the digital signal encoded therein;

a second analog low pass filter; and a digital-to-analog converter (DAC) operatively coupled between said source decoder and said second analog low pass filter, said second analog low pass filter generating an audio output representative of music, if the unique user code bit sequence is recognized, corresponding to the decoded and converted digital signal, said audio output having been wirelessly transmitted to a user for private listening of high fidelity audio music without interference from other users or wireless devices <u>when present in a shared space</u>.

53.   (Currently Amended) A wireless digital audio receiver comprising:

<u>an embedded fuzzy logic detector wherein the fuzzy logic detector activates fuzzy logic rules and performs a defuzzification operation in response to a received unique user code to enhance detection of the unique user code;</u>

a band pass filter (BPF) configured to process a transmitted DSSS signal;

a direct conversion module receiving output from said BPF and being configured to capture ~~a~~ the correct unique user code bit sequence embedded in ~~said processed~~ <u>the received</u> DSSS signal;

~~a fuzzy logic detector to enhance detection of the unique user code bit sequence;~~

a digital demodulator adapted to process output from said direct conversion module;

a Viterbi decoder operatively coupled to said digital demodulator and generating a corresponding digital output;

a source decoder receiving said digital output from said Viterbi decoder and being configured to decode the digital signal encoded therein;

a second analog low pass filter; and

a digital-to-analog converter (DAC) operatively coupled between said source decoder and said second analog low pass filter, said second analog low pass filter generating an audio output, if the unique user code bit sequence is recognized, corresponding to the decoded and converted digital signal, said audio output having been wirelessly transmitted to a user without interference from other users or wireless devices <u>when operated in a shared space containing multiple users of wireless transmission devices</u>.

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54.   (Currently Amended) A wireless digital audio system, comprising:

an audio source to provide an audio signal representative of music having an existing analog headphone ~~plug~~ jack;

a portable battery-powered transmitter coupled to said ~~at least one~~ audio source via said analog headphone ~~plug~~ jack and operative to transmit a code division multiple access (CDMA) communication signal having said audio signal representative of said music and an added unique user code;

a battery-powered audio receiver headphone set operative to receive the CDMA communication signal and utilizing an embedded fuzzy logic detector wherein the fuzzy logic detector activates fuzzy logic rules and performs a defuzzification operation in response to a received unique user code to enhance detection of the unique user code; and audibly reproduce said audio signal representative of said music, if the unique user code is recognized, to provide a particular user with private audio reproduction when operated in a shared space containing other wireless digital audio system users, wherein each of said wireless digital audio system users utilize an independent portable transmitter and audio receiver, free of interference from ~~other~~ users of said other wireless digital audio ~~music~~ systems ~~in a shared space~~.

55.   (Currently Amended) A wireless digital audio system, comprising:

an audio source to provide an audio signal representative of music having an existing analog headphone ~~plug~~ jack;

a portable battery-powered transmitter coupled to said ~~at least one~~ audio source via said analog headphone ~~plug~~ jack and operative to transmit a code division multiple access (CDMA) communication signal having a differential phase shift keying (DPSK) modulated signal of said audio signal representative of said music and an added unique user code;

a audio receiver headphone set operative to receive the CDMA communication signal and utilizing an embedded fuzzy logic detector wherein the fuzzy logic detector activates fuzzy logic rules and performs a defuzzification operation in response to a received unique user code that to enhance detection of the unique user code; and audibly

reproduce said audio signal representative of said music, if the unique user code is recognized, to provide a particular user with private audio reproduction ~~of said music~~ when operated in a shared space containing other wireless digital audio system users, wherein each of said wireless digital audio system users utilize an independent portable transmitter and audio receiver, free of interference from ~~other~~ users of said other wireless digital audio ~~music~~ systems ~~in a shared space~~.

56.   (Cancelled).

57.   (Currently Amended) A wireless digital audio headset receiver, comprising:

a direct conversion module configured to receive a wirelessly transmitted code division multiple access (CDMA) signal having an audio signal representative of audio music and a unique user code; and

utilizing an embedded fuzzy logic detector wherein the fuzzy logic detector activates fuzzy logic rules and performs a defuzzification operation in response to a received unique user code to enhance detection of the unique user code; and headset speakers for privately reproducing said audio music to a user, if the unique user code is recognized, when operated in a shared space containing other wireless digital audio system users, wherein each of said wireless digital audio system users utilize an independent portable transmitter and audio receiver, and free of interference from ~~other~~ users of said other wireless digital audio ~~music~~ systems ~~in a shared space~~.

58.   (Cancelled).

59.   (Currently Amended) A code division multiple access (CDMA) portable battery-powered transmitter comprising:

a ~~jack~~ plug to connect to an existing analog headphone ~~plug~~ jack of an audio source;

means for receiving an audio output ~~representative of music~~ from the audio music source;

means for generating a unique user code that minimizes interference from multiple CDMA transmission sources; and means for wirelessly transmitting a CDMA communication signal having said audio output ~~representative of said music~~ and said unique user code to a wireless headphone receiver, maintaining fidelity between said wireless transmission and said wireless headphone receiver when operated in the presence of separate and independent CDMA transmitters and receivers in a shared space.

60.   (New) A wireless digital audio system, comprising:

an audio source to provide an audio signal representative of music;

a portable digital audio transmitter operatively coupled to said audio source, said portable audio transmitter comprising:

a first analog low pass filter receiving audio output from said audio source;

a digital low pass filter;

an analog-to-digital converter (ADC) operatively coupled between said first analog and digital low pass filters;

a first encoder receiving output from said digital low pass filter and being configured to reduce intersymbol interference (ISI);

a second channel encoder operatively coupled to said first encoder and adapted to reduced transmission errors;

a digital modulator operatively coupled to said second channel encoder; and

a differential phase shift key (DPSK) module receiving output from said digital modulator and being configured for code division multiple access (CDMA) communication, said DPSK module transmitting a corresponding CDMA signal with a unique user code;

an audio receiver configured for digital wireless communication with said portable digital audio transmitter and utilizing an embedded fuzzy logic detector wherein the fuzzy logic detector activates fuzzy logic rules and performs a defuzzification operation in response to a received unique user code to enhance detection of the unique user code, said audio receiver comprising:

a band pass filter (BPF) configured to process said transmitted CDMA signal;

a direct conversion module receiving output from said BPF and being configured to capture the correct bit sequence embedded in the received spread spectrum signal;

a digital demodulator adapted to process output from said direct conversion module;

a Viterbi decoder operatively coupled to said digital demodulator and generating a corresponding digital output;

a source decoder processing said digital output from said Viterbi decoder and being configured to decode the digital signal encoded by said first encoder;

a second analog low pass filter; and

a digital-to-analog converter (DAC) operatively coupled between said source decoder and said second analog low pass filter, said second analog low pass filter generating an audio output corresponding to the decoded and converted digital signal; and at least one module adapted to reproduce said generated audio output, said audio having been wirelessly transmitted from said audio source virtually free from interference from multiple CDMA transmission sources and other device transmitted signals operating in the wireless digital audio system spectrum to a user providing a particular said audio receiver headphone user with independent audio in a shared space with other wireless digital audio system users, wherein each of said wireless digital audio system users utilize an independent portable transmitter and headphone receiver.

61.   (New) A wireless digital audio system, comprising:

a portable audio player;

a portable compact digital transmitter using approximately 100 milliwatts or less of power operatively coupled to said portable audio player wherein said portable compact digital transmitter operatively coupled to said portable audio player is amenable for running;

an audio receiver headphone adapted for digital wireless communication with said portable compact digital transmitter, each of said portable compact digital transmitter and audio receiver headphone being configured for code division multiple access (CDMA) communication;

a direct conversion module configured to capture the correct bit sequence embedded in the received spread spectrum signal; and

a module adapted to audibly reproduce processed CDMA signal, said CDMA communication configuration providing a particular said audio receiver headphone user with independent audio when operated in a shared space with other wireless digital audio system users, wherein each of said wireless digital audio system users utilize an independent portable compact digital transmitter and headphone receiver.